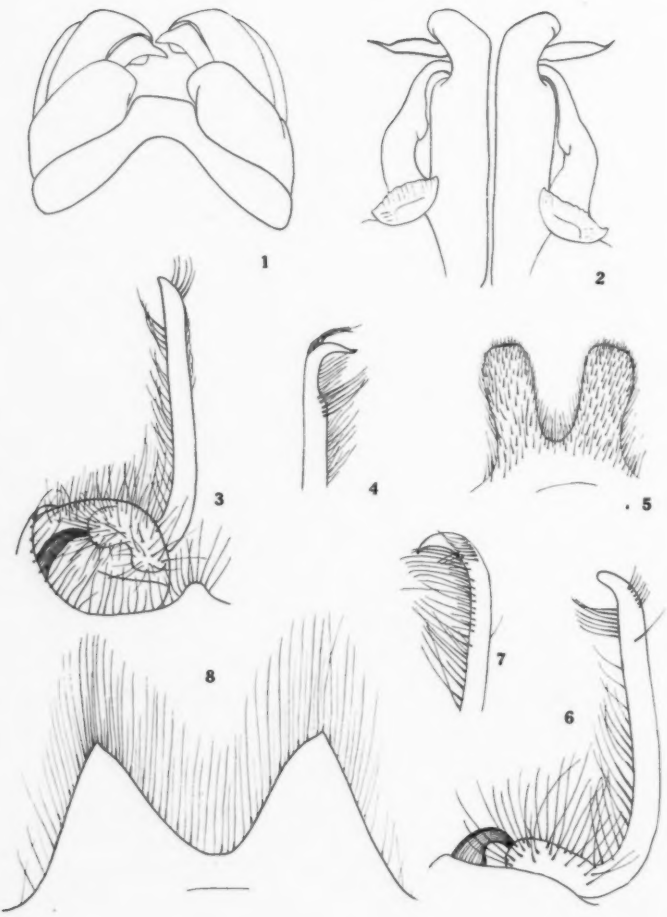

1. SPIROBOLUS OKLAHOMAE.
2. ORTHOPORUS WICHITANUS.
3-5. EURYMERODESMUS MUNDUS.
6-8. E. BIRDI. —CHAMBERLIN.

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On a Collection of Chilopods and Diplopods from Oklahoma.

By RALPH V. CHAMBERLIN, University of Utah.

(Plate II)

There have been few records of Chilopods and Diplopods from Oklahoma. It is a matter of considerable interest, therefore, to be able to report upon an interesting collection of these arthropods made by Professor R. D. Bird of the University of Oklahoma and by him transmitted to me for identification. The types of the four new diplopods represented in the material are deposited in the author's collection.

CHILOPODA.

OTOCRYPTOPS SEXSPINOSUS (Say).

Murray County, Oct. 26, 1929. One specimen. R. D. Bird, coll.

SCOLOPENDRA HEROS Girard.

Carter County, Ardmore, one specimen; Mount Scott, Wichita National Forest, one specimen; Taliga, South Canadian River, one specimen taken in a seine; south of Buffalo Lodge, Wichita National Forest, July 7, 1928; near Camp Boulder, Wichita National Forest, 28 June, 1928, one very young specimen.

SCOLOPENDRA POLYMORPHA Wood.

Norman, June 9, 1929; Woods County, April 29, 1930; one specimen from each locality.

NEOLITHOBIUS SUPRENANS Chamberlin.

Norman, February 23, 1929, one male and one female collected by R. D. Bird; Cleveland County, Mar. 10, 1929, two males collected by R. D. Bird; Woods County, July 25, 1930, one specimen.

ARENOPHILUS BIPUNCTICEPS (Wood).

Norman, Nov. 19, 1930, one specimen collected by N. Wheat; Woods County, July 23, 1930, one specimen collected by R. D. Bird.

SCUTIGERA COLEOPTRATA Linnæus.

Norman, Nov. 21, 1930; Oct. 20, 1929, and Jan., 1931, one specimen on each date.

DIPLOPODA.

LYSIOPETALUM LACTARIUM (Say).

Wichita National Forest, near Buffalo Lodge, two specimens taken under cow dung.

BLANIULUS GUTTULATUS (Bosc).

Sussex County, June 15, 1930. Three specimens.

ETHOIULUS DIVERSIFRONS (Wood).

Cleveland County, April 5, 1929, several males and one female. R. D. Bird coll.

PARAIULUS sp.

Murray County, Apr. 5, 1929. Several immature males and females. R. D. Bird coll.

Spirobolus oklahomae sp. nov. (Plate II, fig. 1.)

General color dark brown or fuscous with a reddish or reddish-brown band caudad of the sulcus on each segment, this band lighter in color down the sides; collum bordered both anteriorly and posteriorly with reddish; head fuscous excepting clypeal border, which is paler. Antennae and legs reddish.

Vertex of head crossed by a fine striaform sulcus which ends anteriorly at level of upper border of eyes; a similarly fine medium longitudinal sulcus from lowest level of antennal sockets to median labral emargination. Occipital region of head densely coarsely punctate, the frontal and clypeal regions more sparsely and more finely punctate, shining, in region between antennal sockets a few, fine transverse striae; below antennal sockets some fine vertical striae. Antenna of usual proportions, and lying in the usual excavation in head and stipes. Clypeal foveolae 5+5 or 6+6.

Collum ending on each side above lower process of second segment in the typical manner, the lower end rounded; margined below and up anterior side to level of eye; surface densely punctate and with fine coriarious markings.

Second tergite produced forward below end of collum on each side, the anterior border of process conspicuously elevated.

All segments densely punctate, the punctae coarser and deeper along depression of sulcus; transverse sulcus caudad of middle, acutely angled at level of pore which lies cephalad of it. Metazonites below crossed by longitudinal striae; striae at same level on prozonite curving forward and upward.

Anal tergite depressed transversely across posterior portion but without sulcus; caudal angle rounded, surpassed by the anal valves.

Anal valves at mesal border moderately compressed and elevated.

Anterior legs of male with proximal joints compressed in the anterio-caudal direction as usual, the third going especially conspicuously flattened, broad in the dorso-ventral plane. Coxal processes of third legs short, columnar, being about as thick distally as proximally, the distal end bearing at middle only an obsolete conical point which is easily overlooked. Processes of fourth and fifth legs short, with conspicuous conical apices.

In the gonopods of the male the anterior or median lamina extended forward at middle in a broad, subquadrate plate, the anterior corners of which are rounded, and the anterior margin scarcely convex. Posterior plate of telopodite of anterior gonopod with outer border convex, the narrowed apical portion reflected caudad and a little ectad at tip. See further the accompanying figures.

Number of segments in male holotype, 52.

Length, about 73 mm.; diameter, 6 mm.

Holotype, male, Murray County, Oct. 4, 1930. R. D. Bird coll.

Also one male at Buffalo Lodge, Wichita National Forest taken June 15, 1928. Two females Pushmatoha County, June 25, 1929. R. D. Bird coll.

This species resembles *S. marginatus;* but it is a smaller form differing in having the median plate of the male gonopods distally truncate as well as in the form of posterior and of anterior gonopods as shown in the accompanying figure.

Orthoporus wichitanus sp. nov. (Plate II, fig. 2.)

General color of the body fuscous with a narrow annulus bordering caudal margin of each segment lighter, more reddish though the lighter annuli are not conspicuous; covered portion of progonites paler. Head fuscous above, lighter in clypeal region excepting a dark band above the labral border, this band curving upward on each side.

Head with a transverse sulcus across posterior portion of occiput running between posterior angles of eyes and angulate at middle; a finer median longitudinal sulcus running from angle of the transverse sulcus across vertex to join a fine transverse impressed line between inner angles of eyes. No median sulcus below. On each side just in front of the occipital transverse sulcus a series of shorter, and overlapping, curved transverse lines; the vertical region otherwise smooth and shining. Lower frontal region somewhat roughened with impressed, mostly irregular furrows or sulci, the adjacent cylpeal region

similarly marked but also subdensely punctate. Labral border about 18 setigerous foveolae in depressions separated by short longitudinal ridges.

Collum not inflexed below; the anterior lateral corner in the male extended forward in a well rounded lobe which is margined with a sulcus. A second sulcus subparallel to the margining one extends farther dorsad; a third sulcus is subparallel to the second one below but does not extend up dorsad beyond middle of the anterior lobe; a fourth sulcus runs from the posterior-lateral or lower corner, curving forward and upward to the level of lower edge of eye; a fifth sulcus caudad of the fourth is short, like the third; and a sixth sulcus, which curves still less than the fourth, extends dorsad a little beyond upper end of the latter. On each side caudad of these striae a number of irregular, short, more weakly impressed, longitudinal striae. Smooth and shining above.

Tergites in general densely but very finely punctate. Segmental sulcus strongly impressed, cross-ribbed; preceded over prozonite above by finer transverse striae. Longitudinal striae strongly impressed below, across metazonite. Segmental pore well removed from the sulcus which is not at all or but vaguely excurved opposite it.

Anal tergite not covering the valves completely; angle of caudal portion rounded, the caudal triangular portion set off by a strongly impressed transverse sulcus, the tergite in front of this sulcus densely punctate, and caudad of it strongly punctorugose. Anal valves with margins strongly elevated; surface punctate but not rugose.

Anterior gonopods each with ventral end produced into a lobe which bends outward below base of cone and is rounded at the end; the lateral cone extending directly laterad, acuminate, terminating in a slenderly acute, sigmoidal tip. Coxa of posterior gonopod curving upward and ending about half-way to base of anterior gonopod, where it presents on the mesal side a short angular prominence or spur; telopodite broadly laminate as usual, expanding and curving toward free end.

Segments in male holotype, 64-66.

Diameter of holotype 7 mm.; length, about 115 mm.

A female allotype is about 120 mm. long; diameter 10 mm.

Holotype, male, Elk Mountain, Wichita Forest Reserve, June 22, 1928. Female *allotype* taken July 9th west of Elk Mountain, N. M. Newport coll.

This species, the sole representative of the genus known from this part of the United States, may be recognized at once by

the form of the conspicuous, acuminate lateral cones of the anterior gonopods and the form of the telopodite of the posterior gonopods as shown in the accompanying figure.

POLYDESMUS PINETORUM Bollman.

Norman Black Jack Forest, Feb. 26, 1930, one male and one female, D. Zeigler coll.

Eurymerodesmus* birdi sp. nov. (Plate II, figs. 6-8).

Dorsum in general brown, with a wide median longitudinal strip lighter, sometimes yellowish, in some bisected by a darker arterial line; the keels also yellowish; sides and venter yellow, collum bordered with yellow all the way around. Head with a network of dark lines over vertex; a dark spot under base of each antenna. Legs fine yellow to brown, antennae brown, typically darker than the legs, the sixth joint darker than the others.

Head smooth. Vertigial sulcus sharply impressed, ending at level of antennal sockets. Antennae filiform, the ultimate article alone narrowed, having the usual four sensory cones.

Collum narrower than second tergite in about same degree as latter is narrower than the third; lateral ends narrowed and distally rounded as usual; anterior margin straight over median region, the lateral portion slanting to ends and a little incurved at middle; posterior margin straight or slightly incurved over middle region, the lateral portion convex, bending forward to ends; keel narrowly margined on posterior side, the margination broader about ends and the sulcus paralleling outer margin and gradually fading out on dorsal region.

In the succeeding tergites the margins of the keels are thickened, the labial margin being swollen and set off by a distinct depression the other margins more narrowly elevated; lateral margin in dorsal view evenly convex, smooth. Posterior angles of 16-19 keels produced caudad in incurving degree from first of these to the 19th.

Anal tergite with the caudal processes narrowly truncate at the end. And valves with margins elevated and closely oppressed. Each elevated border having a long seta towards its upper end. Anal scale with sides strongly convex, narrowed caudad, producing an angle on median caudal line, each side of which is a long seta.

In the male there is a pair of short, rounded prominences between each pair of legs of the sixth segment, these processes

* For characteristics of the genus see Chamberlin, Proc. Biol. Soc. Wash., 1920, vol. 33, p. 97.

strongly setose at distal ends. On the seventh segment there is on each side of the gonopods a triangular process or lamina which is setose. Each gonopod has a telopodite which runs transversely against the basal lobe to its mesal end, then runs sub-ventrally on a nearly straight blade to a transverse, subunciform terminal portion; the terminal transverse portion short with an acute and somewhat recurved point; blade strongly setose on mesal margin to apical portion which has setae on caudal side of base but is distally glabrous. See figures.

Length, about 32 mm.; width, 4.5 mm.

Holotype, male, Murray County, Oct. 17, 1929, R. D. Bird coll. Also from the same locality one adult male and one female and two immature specimens.

This species is readily distinguished from the genotype by the details of the gonopods and by the triangular form of the connected sternal processes of the seventh segment. These processes are conspicuously different in size and shape from those of the following species, *E. mundus*. The form of the gonopods is shown in the accompanying figures.

Eurymerodesmus mundus sp. nov. (Plate II, figs. 3-5.)

General color of the dorsum brown with the carinae and caudal borders of the tergites brick-red; the brown color extending down the sides on the prozonites farther than on the metazonites beneath the keels, the sides otherwise and the venter light yellow. Collum bordered anteriorly as well as posteriorly with red. Head brownish above, darker over area between antennae and over upper clypeal region, the labral and lateral borders yellow; antennae yellowish tinged with brown. The brown denser on fifth and especially on the sixth segment, and on proximal portion of the seventh. Legs yellow.

Head smooth. Vertigial sulcus sharply impressed, ending near upper level of antennal sockets, the terminal portion widened. Antennae filiform, the seventh article above narrowed.

Lateral ends of collum narrowly rounded, the line connecting them running well caudad of middle; median portion of anterior margin nearly straight, slightly convex, the lateral portion curving widely and evenly to lateral end; caudal margin bending forward over lateral portion to the end. Margined about lateral ends, where the border is more thickened, and along anterior and posterior borders part way to the median line.

In the succeeding tergites the anterior corners of the keels are all well rounded. Anterior tergites in general with lateral portion of caudal margins running obliquely forward and becoming more and more nearly transverse in middle and posterior regions; posterior angles of 18th and 19th tergites distinctly produced, but distally well rounded; the corners of a few preceding tergites slightly extended caudad. Lateral margins of keels as seen from above smooth and convex; the lateral margins of keels strongly thickened, the anterior and posterior borders more narrowly thickened or margined.

Last tergite with narrower caudal portion the sides of which converge to a narrowly truncate apex; the caudal portion yellow except for reddish stripe at its base. Valves with mesal borders narrowly elevated or thickened. Anal scale semicircular, the caudal margin convex and with a setigerous tubercle each side of middle region.

Sternal process between legs of sixth segment obsolete; and none present between posterior legs of seventh segment; those on eighth segment very small.

In the male the seventh segment presents behind the gonopods a pair of stout, columnar or somewhat clavate processes which are united at base by a low transverse lamina; a low lamina ectad of each column extends laterad and a little cephalad, its free margin slanting from near middle of length of the column rapidly to surface of somite. Telopodites of gonopods rising from mesal side of basal segments, each telopodite a nearly straight blade which narrows gradually to level of free end of the column where it bends abruptly caudad and is apically acute; the caudal surface of telopodite densely setose up to level of the apical portion as shown in the figures.

Length of male holotype, about 27 mm., the width, 5 mm.

Holotype, male, Norman, Black Jack Forest at University, 26 Feb., 1930, D. Zeigler coll.

Also from the same locality two males, 1 male 10 mm., 1929, R. D. Bird. Cleveland County, 1 male, April 5, 1929. A number of immature specimens, apparently this species, taken near Camp Boulder, Wichita National Forest, 8th June, 1928.

The species is conspicuously different from other known species of the genus in the form of the sternal processes of the seventh segment of the male. These are columnar in form, parallel in position and are connected at bases in the usual way. They are fully as long as the gonopods which they completely conceal in posterior view. See figures.

EXPLANATION OF PLATE II.

Fig. 1. *Spirobolus oklahomae* n. sp., anterior view of gonopods of male.
Fig. 2. *Orthoporus wichitanus* n. sp., gonopods of male.
Fig. 3. *Eurymerodesmus mundus,* right gonopod of male, anterior view.
Fig. 4. *Eurymerodesmus mundus* n. sp., distal end of right gonopod of male, lateral view.
Fig. 5. *Eurymerodesmus mundus* n. sp., sternal processes of seventh segment of male, caudal view, less highly magnified than figs. 6 and 7.
Fig. 6. *Eurymerodesmus birdi* n. sp., right gonopod of male, anterior view.
Fig. 7. *Eurymerodesmus birdi* n. sp., apical portion of left gonopod of male, sublateral view.
Fig. 8. *Eurymerodesmus birdi* n. sp., sternal processes of seventh segment of male, anterior view.

Descriptions of New Genera and Species of the Dipterous Family Ephydridae. Paper IX.*

By EZRA T. CRESSON, JR.

Hydrellia serena new species.

Black, including tibiae and tarsi; palpi fulvous, halteres lemon yellow. Nearly shining, sparingly dark brown pollinose, with frontalia broadly velvety-black from dorsal aspect. Lunule, face, cheeks, tormae, and undersurface of thorax, grayish; humeri and mesopleura dark, concolorous with mesonotum. Face not prominent in profile, weakly convex, the bristles not much stronger than the aristal hairs. Antesutural dorsocentral very weak, scarcely differentiated from surrounding setulae. Fifth abdominal segment of male acutely triangular, slightly longer than fourth.

Length, 2 mm.

Type.—Male; Ilwaco, WASHINGTON, July, 1917, (A. L. Melander), [A.N.S.P., no. 6482]. *Paratypes.*—3♂, 6♀; topotypical.

This species is similar to my conception of *nigricans* of Europe, with the dorsocentrals developed as in *scalaris,* but

* Paper VII. See ENT. NEWS, XXXVI, p. 165, (1925).
Paper VIII. See ENT. NEWS, XLI, p. 76, (1930).

the fifth abdominal segment of male similar to that of *cruralis*. In our lineal arrangement we will place the species between *tibialis* and *formosa*.

Hydrellia platygastra new species.

Black including palpi and antennae; halteres lemon yellow, extreme apices of femora, bases and apices of tibiae and most of tarsi, brown to tawny. Somewhat shining especially the abdomen, obscured by grayish brown pollen. Frons subopaque with velvety-black frontalia. Face entirely opaque, velvety-brown or black. Pleura below and posteriorly somewhat grayish; humeri and mesopleura dark, concolorous with mesonotum. Frons broad, with reclinate frontal bristle very strong; face almost flat in profile. Antesutural dorsocentral strong and near sutural region. Abdomen of male with third and following segments strongly compressed laterally, dilated dorso-ventrally; genital segment very large. Length, 2.5 to 3 mm.

Type.—Male; Beaver Creek, Newport, OREGON, (J. M. Aldrich), [A.N.S.P., no. 6483]. *Paratypes*.—1 ♂, 5 ♀; topotypical.

A species very easily distinguished by the dark, velvety-black face, black antennae and palpi. The laterally compressed abdomen of the male is very characteristic and is shared by but very few other species in this genus. This and the next species we will place following *nobilis*, but they seem to constitute a small group of themselves.

Hydrellia morrisoni new species.

Very similar to *platygastra* but face is whitish, the antesutural dorsocentral is reduced, and the hind tarsi very noticeably dilated medianly.

Black including palpi, antennae and tibiae; halteres lemon-yellow, tarsi brownish. Opaque cinereous; abdomen more shining. Frons and mesonotum dark gray; frontalia not well marked; lunule gray; face white becoming gray along orbits. Reclinate frontal bristle present; face in profile weakly convex. Antesutural dorsocentral weak. Middle tibiae in male as thick as femora; hind tibiae dilated medianly with convex extensor margin and flattened anterior surface. Length, 2.5 mm.

Type.—Male; White Mountains, NEW HAMPSHIRE (Morrison), [U.S.N.M., no. 43453]. *Paratype*.—1 ♂; topotypical.

Hydrellia americana new species.

Very similar to *albilabris* Meigen of Europe, but the pleura are slightly grayish, not so intensely black as in that species. From *tibialis* it differs in having the frons more velvety-black, at most only the upper part of the medifrons not included; the proocellar bristles are also weaker in this species.

Black including antennae and palpi; halteres lemon-yellow. Subopaque, sparingly brownish pollinose. Frons velvety-black except sometimes at vertical margin; proocellar bristles very weak, much weaker than the frontorbitals. Face and lunule silvery-white. Pleura slightly grayish not opaque. Length, 1.5 to 1.8 mm.

Type.—Female; Chesapeake Beach, MARYLAND, August 2, (J. M. Aldrich), [U.S.N.M., no. 43454] *Paratypes*.—2 ♀; Machias, MAINE, July 17, and 19, (C. W. Johnson), [Boston Soc. Nat. Hist.]. 1 ♀; Wilmington Notch, Adirondacks, NEW YORK, July 3, (Aldrich), [U.S.N.M.].

The male is unknown.

Hydrellia subnitens new species.

A western species suggesting our eastern *cruralis* Coquillett, but more shining, with dark tibiae, and very narrow cheeks.

Black; third antennal segment except disk, mouthparts, face, extremities of tibiae, and all tarsi except apices, yellow. Halteres lemon-yellow. Frons rather opaque, brownish, with frontalia scracely differentiated from the trapezoidal medifrons; lunule white as is also the face, but not sericeous. The latter twice as long as broad, weakly and evenly convex in profile, with long slender bristles and very narrow, linear parafacials. Cheeks very narrow. Arista with seven to eight well spaced hairs.

Mesonotum including humeri, notopleura and scutellum, dark, subopaque, brown pollinose; mesopleura except extreme upper margin, gray. Antesutural dorsocentral strong, well removed from sutural region. Abdomen broad, almost shining, brownish pollinose; fifth segment of male much longer than fourth, rather broadly truncate. Wings long; second costal section twice as long as third. Length, 2.4 mm.

Type.—Male; Tacoma, WASHINGTON, August 27, 1911, (A. L. Melander), [A.N.S.P., no. 6484]. *Paratypes*.—2 ♂, 1 ♀; topotypical.

Hydrellia crassipes new species.

Apparently very similar to *atroglauca* Coquillett, but with dark tibiae. I have not seen a male of *atroglauca*.

Black; palpi and tarsi tawny. Halteres whitish. Opaque; mesonotum including humeri, scutellum and dorsum of abdomen, dark, subopaque, dark ocherous pollinose; lower occiput, pleura, venter of abdomen, femora and tibiae, gray to whitish. Frons opaque black, with frontalia scarcely differentiated; lunule white. Face and cheeks plumbaceous to yellowish gray, not sericeous; former nearly three times as long as broad, in profile convex, somewhat prominent below middle, with four to six rather stout bristles each side. Cheeks not as broad as third antennal segment. Arista with seven to nine hairs.

Antesutural dorsocentral strong and well separated from postsutural pair, with intermediate setula. Abdomen ovate with third to fifth segments subequal in length; the fifth triangular, acute apically. Hind femora of male stout and slightly arcuate; their tibiae with a conspicuous foliaceous flexor dilation. Length, 2.2 to 2.5 mm.

Type.—Male; Sandusky, Cedar Point, OHIO, August 4, 1902, [Ohio State University]. *Paratypes*.—19 ♂, 28 ♀; topotypical.

Hydrellia decens new species.

In lacking the reclinate frontal bristles, this species suggests *proclinata*, Cresson, but here we have a very shining, metallic colored form.

Black including antennae and palpi; halteres yellowish white. Shining to polished, metallic colored; mesonotum including humeri, and notopleura, dark; upper part of pleura and metanotum brownish. Frons and upper occiput subopaque, frontalia opaque black; reclinate frontal bristles not developed; lunule gray. Face rather narrow with parallel facialia, opaque brownish to black, grayish laterally; in profile, weakly convex; bristles hairlike. Arista with about ten hairs. Antesutural dorsocentrals strong and well removed from the postsutural pair. Length, 2.3 mm.

Type.—Female; MARYLAND near Plummers Island, August 12, 1914, (R. C. Shannon), [U.S.N.M., no. 43455]. *Paratypes*.—1 ♀; topotypical. 1 ♀; Plummers Island, Maryland, July 13, (W. L. McAtee), [Biol. Surv.].

The male sex is unknown.

Hydrellia pulla new species.

A robust, strongly bristled species, with prominent subconical face. Its systematic position is rather doubtful, but can be placed in the group with *atroglauca*.

Black; palpi tawny, halteres lemon-yellow. Upper surfaces brown, nearly opaque; face, occiput, pleura below, bluish gray; humeri notopleura and upper part of mesopleura dark. Frons opaque black with scarcely differentiated black frontalia; reclinate frontals strong; lunule small, concolorous with face. Face in profile conically prominent medianly, with four to five stout bristles. Arista with seven hairs. Antesutural dorsocentrals strong and well removed from sutural region. Length, 3 mm.

Type.—Female; Spencer lake, NEW YORK, June 30, 1907, [Cornell]. *Paratype*.—1 ♀; Goshen, CONNECTICUT, July 6, 1919, (M. P. Zappa), [Boston].

The male sex is unknown.

Hydrellia notiphiloides new species.

A species allied to *cruralis* Coq. but having the tibiae dark.

Black; palpi and hateres pale yellow. Opaque; mesonotum, scutellum and abdomen somewhat shining, brown to grayish pruinose; lunule, face, cheeks, white, sometimes yellowish; occiput, pleura, lateral margins of abdomen venter, and femora, cinereous; humeri gray concolorous with pleura, contrasting with the dark notopleura and mesonotum. Frons brownish, with frontalia somewhat differentiated, blackish; reclinate frontal bristle strong. Face broad, in profile, convex, with three to five stout bristles. Cheeks broad, about one-third eye-height in width. Antennal arista with six hairs. Mesonotal bristles and setulae strong; antesutural dorsocentrals strong and well removed from postsutural pair. Abdomen with segments broad, subsequal in length; fifth of male convex, acute. Length, 2 to 2.5 mm.

Type.—Male; Cedar Point, Sandusky, OHIO, August 5, 1902, [Ohio State University]. *Paratypes*.—1 ♂, 5 ♀; topotypical 1 ♂; topotypical, June 30, 1 ♂; Nantucket, MASSACHUSETTS, July 20, 1910, [Boston Soc. Nat. Hist.].

Notes on Some Butterflies of Northeastern Georgia.

By Robert W. Montgomery, Poseyville, Indiana.

During the summer of 1930 collecting was done in Habersham and Banks counties, Georgia. These two counties are in the edge of Blue Ridge Mountains; collecting was done at elevations varying from 1400 to 1800 feet.

Many types of localities, including peach and apple orchards, shrub covered pastures, marshes, woodlands, roadsides and flower gardens were visited. But one species was found in woods and that near the edge. The absence of flowering vegetation in the woods was no doubt the reason for this.

The writer was accompanied on collecting trips by H. T. Vanderford and Erskine M. Livingstone.

Papilionidae.

1. Papilio philenor L. Taken from all localities except woodlands, June 26-September 7. The emergence of a brood began about August 8.

2. Papilio polyxenes Fab. A very few specimens from orchards and flower gardens, August 12-30.

3. Papilio turnus L. A few specimens taken at intervals from June 30-September 1. Flower gardens and orchards. Form *glaucus* L. from flower gardens and marsh, June 25, September 1.

4. Papilio troilus L. Marsh, orchards and flower gardens, July 13-September 7.

Pieridae.

5. Pieris protodice Bdv.-Lec. A few specimens from flowers, August 24-30.

6. Pieris rapae L. Flower and vegetable gardens, May 26-August 30.

7. Catopsilia eubule L. One specimen from flower garden, August 25; one specimen from marsh, September 1.

8. Colias eurytheme Bdv. Two specimens from pasture, June 21, September 7.

9. Terias nicippe Cram. A single specimen from pasture, August 24.

10. Terias lisa Bdv. Captured in all localities visited, July 21-September 7.

Danaidae.

11. Danais plexippus Fab. Pastures, marshes and orchards, August 24-September 7.

SATYRIDAE.

12. NEONYMPHA GEMMA Hbn. Five specimens from an orchard, June 16. This was an old orchard and afforded a dense shade. One specimen from marsh at border of dense woods, August 28.

13. CERCYONIS ALOPE Fab. A single specimen from an orchard, August 25. When first observed it was resting on the top of an Oriental Fruit Moth bait trap.

NYMPHALIDAE.

14. DIONE VANILLAE L. Taken from all localities except woodlands, August 12-September 18. A newly emerged male taken September 16.

15. EUPTOIETA CLAUDIA Cram. Pastures, orchards, flower gardens, and roadsides, July 12-September 7.

16. ARGYNNIS DIANA Cram. A single specimen captured on street in Cornelia, July 10.

17. ARGYNNIS CYBELE Fab. Two specimens from orchards, July 23, Aug. 10.

18. PHYCIODES THAROS Drury. Pastures, orchards, flower gardens and roadsides, May 26-September 1.

19. CYNTHIA HUNTERA Fab. One specimen from an orchard, August 12; one from a marsh, September 1.

20. CYNTHIA CARDUI L. One specimen from roadside, July 27.

21. JUNONIA COENIA Hbn. Taken from all localities except woodlands, July 27-September 1.

22. BASILARCHIA ASTYANAX Fab. Three specimens, all from orchards, July 27, August 24.

LYCAENIDAE.

23. STRYMON CECROPS Fab. One specimen from marsh at edge of woods, August 24.

24. STRYMON MELINUS Hbn. One specimen from an orchard, July 27.

25. LYCAENA HYPOPHLEAS Bdv. A single specimen taken from a marsh, August 24.

26. EVERES COMYNTAS Godt. Pastures, marshes and roadsides, June 17-September 17.

27. GLAUCOPSYCHE PSEUDARGIOLUS Bdv.-Lec. Marsh, roadside, August 24.

HESPERIDAE.

28. EPARGYREUS TITYRUS Fab. May 10-September 1.

29. ACHLARUS LYCIADES Gey. July 10, September 7.

30. THORYBES PYLADES Scud. July 21-August 29.
31. THORYBES BATHYLLUS S. & A. July 27-September 7.
32. HESPERIA CENTAUREAE Ramb. September 1.
33. HESPERIA TESSELATA Scud. August 24.
34. PHOLISORA CATULLUS Fab. August 26.
35. ANCYLOXIPHA MUMITOR Fab. September 7.
36. HYLEPHILA CAMPESTRIS Bdv. August 24, September 7.
37. AMBLYSCIRTES VIALIS Edw. July 27.

Papilio daunus Boisd. in Scott County, Kansas (Lepid.: Papilionidae).

The occurrence of this magnificent species of the genus *Papilio* here on the western Kansas prairie is very interesting, geographically. From available data concerning the species *daunus*, it appears to be a typical mountain species, or at most, confined to the valleys and slopes of the Rocky Mountain ranges, extending from Idaho southward into Mexico.

For the past few years, I have usually encountered *daunus* on my collecting rounds, and have taken a few each year. It does not occur in sufficient numbers, however, to call it a common insect in this locality. When on the wing, it is apt to be confused with specimens of *glaucus;* as a rule, however, *glaucus* specimens are much smaller than *daunus* and the larger size of *daunus* may serve to distinguish between the two when flying, as they often fly in company with each other. The insect, as encountered in this region, has a very wide wing expanse for summer examples, the females measuring four and a half to five inches, the males being a trifle smaller.

A fact concerning *Papilio daunus* not usually known, and not mentioned in any reference books, is that it is double-brooded in its more southern limits, the first brood emerging from over-wintering chrysalids and appearing during the latter part of the month of April and the first of May; the second, or summer brood, produced from the eggs laid by the females of the first generation, and appearing in June and July, and even August. The specimens of the first brood are quite small and ordinary looking, measuring from three to three and a half inches as compared with the giants of June, and later, that measure four inches and more.

It would seem that *daunus* in its more northern ranges is single-brooded, and that it has been almost entirely the summer examples, according to their size, that have found their way into collections and illustrations.

VIRGIL F. CALKINS, Scott City, Kansas.

Abnormal Antenna in Eleodes (Coleop.: Tenebrionidae).

By ORLANDO PARK, Department of Zoölogy, University of Illinois.

Among a number of tenebrionids received some months ago from New Mexico, a female of *Eleodes carbonaria* (Say) was observed to have an abnormal right antenna. The distal border of the fifth segment was distorted. From this area of the segment arose an accessory structure one millimeter long, which bore several bristle-bearing punctures. This palp-like piece projected distally and ended in a thickened knob which was distinctly notched on its apex. Near the point where the piece turned distally, a small projection was given off which extended proximally, as can be noted in the accompanying figure. This accessory piece of the fifth segment did not show articulating surfaces under a magnification of forty diameters.

An articulating surface could not be discerned between the malformed fifth and the sixth segments of the right antenna, the latter being firmly set into the fifth in such a way that antennal movement must have been peculiar in life.

The left antenna of this individual was normal, normality being determined by comparison with antennae of other individuals of the species (12 ♀ ♀, 9 ♂ ♂) taken from the same area over a period of five years.

Finally, the left mesothoracic femur of the specimen being described had been diagonally fractured at some time, and the fracture had subsequently healed over to form a femur conspicuously bent and irregular.

Bateson ('94) listed six cases of paired supernumerary antennae (pp. 522-523), and seven cases of supposedly double antennae (p. 551) in heteromerous beetles, these abnormalities being reported by a number of workers. The malformed *Eleodes* described above, however, is not easily treated. In a previous note (Park, '28) literature was cited on the possible effect of injury and this abnormality might be the result of one

of many feasible accidents. If so, the right antenna may or may not have been injured at the same time as the left middle leg. Again, the fifth segment might not have been injured, and the accessory structure noted may represent a duplicating right antenna in an undeveloped condition. Finally, the knob-like proximal projection may be significant, in that the fifth segment may have shown an abortive tendency to form a pair of supernumerary antennae. However, this latter is hardly tenable in view of the unjointed and rudimentary condition of the malformation.

I am indebted to Mr. William J. Gerhard and to Mr. Emil Liljeblad of the Field Museum of Natural History for the determination of this interesting specimen. The latter was taken beneath a loose board on the ground, at Las Cruces, New Mexico, by Mr. R. S. Campbell on July 21, 1929, and is now in the collection of the writer.

LITERATURE CITED.

BATESON, WILLIAM. 1894. Materials for the study of variation. London: Macmillan and Co., xvi + 598 pp.

PARK, ORLANDO. 1928. Bifurcation of antenna in Balaninus. Ent. News, 39: 219-220.

Dixie Dragonflies Collected during the Summer of 1930 (Odonata).

By C. FRANCIS BYERS. Dept. of Biology, University of Florida.

During the summer of 1930 the Museum of Zoology of the University of Michigan financed a collecting trip for insects into the southeastern portion of the United States. The author, from the University of Florida, and Mr. Herman Spieth, from the University of Indiana, plus a model-T Ford, plus the field man's usual outlay of paraphernalia, constituted the expedition.

The start was made from Gainesville, Florida, at noon on June 19th. Camp was established that night at McClenny, Florida, near the banks of the St. Marys River. As the primary aim of the collectors was to secure specimens of the insect orders *Odonata* (dragon-flies) and *Ephemerida* (may-flies), the selection of camp and collecting sights was restricted to regions near bodies of water, mostly on this trip, to rivers. The following table will give the reader an idea of the region covered with dates, localities visited, etc.

TABLE.

Date	State	County	Locality	River System or Lakes
June 19-20	Florida	Baker	McClenny	St. Marys
" 22	Georgia	Glynn	Everett City	Altamaha
" 22-23	"	Wayne	Jesup	"
" 24-25	"	Laurens	Dublin	Oconee
" 25	"	Wilkinson	Irwinton	"
" 25	"	"	Milledgeville	Black Lake
" 26	"	Jefferson	Louisville	Ogechee
" 26-27	"	Burke	Keysville	Savannah
" 28	"	Johnson	"	"
" 29	S. Carolina	Greenwood	Ware Shoals	Saluda
" 30	"	Newberry	Chappells	"
July 1	N. Carolina	Mecklenburg	Pineville	Catawba
" 2-3	"	Wilkes	N. Wilkesboro	Yadkin
" 4	"	Ashe	W. Jefferson	New River
" 4	"	Caldwell	Lenoir	
" 5-6	"	McDowell	Marion	Catawba R. L. Tahoma
" 8-9	"	Swain	Bryson City	Tuskasegee
" 10-11	"	Macon	Highlands	
" 13	Georgia	Floyd	Rome	Coosa
" 19-23	Florida	Alachua	Gainesville	
" 19	"	Liberty	Rock Bluff	Apalachicola
" 23-24	Georgia	Dooly	Vienna	Flint
" 24	"	Spalding	Griffin	"
" 25	"	Gwinnett	Lawrenceville	Yellow
" 27-28	N. Carolina	Cherokee	Murphy	L. Tennessee
" 30-31	"	Swain	Bryson City	Tuskasegee
Aug. 1-9	"	"	" region	Great Smoky drainage
" 9	Tennessee	Sevier	Sevierville	"
" 10	"	"	Gatlingburg	"
" 11	"	"	Elkmont	"

The following is the list of species of dragon-flies collected in the states of Florida, Georgia, South Carolina, North Carolina and Tennessee during the summer of 1930 (June 19-August 11). The number in parenthesis indicates the number of specimens taken of that species which it follows. Only the names of the counties and states are given. For additional information see the table of localities. The total list numbers about 500 specimens, 33 genera and 72 species.

List of Species.

SUBORDER ANISOPTERA.

SUBFAMILY GOMPHINAE.

1. PROGOMPHUS OBSCURUS (Rambur)—(9) Johnson, Wayne—Georgia.
2. HAGENIUS BREVISTYLUS Selys—(1) McDowell—North Carolina.
3. GOMPHUS SCUDDERI Selys—(1) Swain—North Carolina.
4. G. SPINICEPS (Walsh)—(3) Swain—North Carolina.

5. G. PLAGIATUS Selys—(1) Floyd—Georgia.
6. G. sp?—(2) Floyd—Georgia.
7. DROMOGOMPHUS ARMATUS Selys—(2) Burke—Georgia.
8. D. SPINOSUS Selys—(11) Floyd, Laurens, Wilkinson—Georgia; McDowell—North Carolina.
9. ERPETOGOMPHUS DESIGNATUS Hagen—(3) Sevier—Tennessee.

SUBFAMILY AESCHNINAE.

10. BOYERIA VINOSA (Say)—(5) Burke—Georgia; Cherokee, Swain—North Carolina.
11. CORYPHAESCHNA INGENS (Rambur)—(2) Baker, Glynn—Georgia.
12. ANAX JUNIUS (Drury)—(6) Macon, McDowell—North Carolina.
13. A. LONGIPES Hagen—(1) Macon—North Carolina.
14. AESHNA UMBROSA Walker—(1) Swain—North Carolina.
15. NASIAESCHNA PENTHACANTHA (Rambur)—(2) Glynn, Wayne—Georgia.
16. EPIAESCHNA HEROS (Fabricius)—(5) Burke, Glynn—Georgia.

SUBFAMILY CORDULIINAE.

17. MACROMIA ALLEGHANIENSIS Williamson—(2) Cherokee, Swain—North Carolina.
18. M. GEORGINA (Selys)—(16) Alachua—Florida; Greenwood—South Carolina; Laurens—Georgia.
19. M. ILLINOIENSIS Walsh—(4) Cherokee, Swain—N. Carolina; Sevier—Tennessee.
20. M. TAENIOLATA Rambur—(8) Burke, Laurens, Wayne—Georgia.
21. EPICORDULIA REGINA Selys—(2) Laurens—Georgia.
22. TETRAGONEURIA STELLA Williamson—(1) Wayne—Georgia.
23. SOMATOCHLORA ELONGATA Scudder—(1) Macon—North Carolina.
24. S. LINEARIS (Hagen)—(8) Burke, Floyd—Georgia.

SUBFAMILY LIBELLULINAE.

25. CELITHEMIS AMANDA (Hagen)—(2) Baker—Florida.
26. C. ELISA (Hagen)—(1) McDowell—North Carolina.
27. PERITHEMIS SEMINOLE Calvert—(2) Alachua—Florida; Wayne—Georgia.
28. P. TENERA (Say)—(10) Burke, Gwinnett—Georgia; Greenwood—S. Carolina.
29. LIBELLULA AURIPENNIS Burmeister—(5) Baker—Florida; Glynn, Jefferson—Georgia.
30. L. AXILLENA Westwood—(7) Baker—Florida; Glynn, Wayne—Georgia.

31. L. CYANEA Fabricius—(2) Mecklenburg, McDowell—North Carolina.
32. L. FLAVIDA Rambur—(7) Burke—Georgia; Swain, Wilkes—North Carolina.
33. L. INCESTA Hagen—(10) Baker—Florida; Burke, Dooly, Glynn, Laurens, Wayne—Georgia.
34. L. LUCTUOSA Burmeister—(3) Mecklenburg, McDowell—North Carolina.
35. L. LYDIA Drury—(6) Floyd, Gwinnett, Laurens—Georgia; Macon, McDowell—North Carolina.
36. L. PULCHELLA Drury—(2) Mecklenburg—North Carolina.
37. L. SEMIFASCIATA Burmeister—(1) Glynn—Georgia.
38. L. VIBRANS Fabricius—(9) Burke, Glynn, Laurens—Georgia; Liberty—Florida.
39. SYMPETRUM VICINUM (Hagen)—(3) McDowell—North Carolina.
40. ERYTHRODIPLAX MINUSCULA (Rambur)—(8) Baker—Florida; Jefferson, Wayne—Georgia; Wilkinson, McDowell—North Carolina.
41. PACHYDIPLAX LONGIPENNIS (Burmeister)—(33) Baker—Florida; Burke, Dooly, Glynn, Gwinnett—Georgia; Mecklenburg, McDowell, Wilkes, Wilkinson—North Carolina.
42. ERYTHEMIS SIMPLICICOLLIS (Say)—(8) Baker—Florida; Gwinnett, Laurens—Georgia; McDowell, Wilkinson—North Carolina.
43. TRAMEA CAROLINA (Linne)—(3) Baker—Florida; Glynn, Wayne—Georgia.
44. T. LACERATA Hagen—(2) McDowell—North Carolina.
45. PANTALA FLAVESCENS (Fabricius)—(1) Greenwood—South Carolina.
46. P. HYMENAEA (Say)—(1) Greenwood—South Carolina.

SUBORDER ZYGOPTERA.

SUBFAMILY AGRIONINAE.

47. AGRION APICALE (Burmeister)—(8) Burke, Gwinnett—Georgia; McDowell—North Carolina.
48. A. DIMIDIATUM (Burmeister)—(9) Dooly, Wayne—Georgia; Liberty—Florida.
49. A. MACULATUM Beauvais—(33) Liberty—Florida; Dooly, Jefferson, Wayne—Georgia; Greenwood—South Carolina; Ashe, Cherokee, Macon, Mecklenburg, McDowell, Swain, Wilkes, Wilkinson—North Carolina.
50. HETAERINA AMERICANA (Fabricius)—(7) Sevier—Tennessee; Swain—North Carolina.
51. H. TITIA (Drury)—(2) Floyd—Georgia.

SUBFAMILY LESTINAE.

52. LESTES FORCIPATUS Rambur—(1) Macon—North Carolina.
53. L. RECTANGULARIS Say—(3) Macon, McDowell—North Carolina.

SUBFAMILY COENAGRIONINAE.

54. ARGIA APICALIS (Say)—(38) Burke, Dooly, Floyd, Laurens—Georgia; Greenwood, Newberry—South Carolina; Caldwell, Cherokee, McDowell, Swain, Wilkes—North Carolina; Sevier—Tennessee.
55. A. BIPUNCTULATA (Hagen)—(16) Baker—Florida; Greenwood—South Carolina; Jefferson—Georgia.
56. A. MOESTA PUTRIDA (Hagen)—(10) Baker—Florida; Dooly, Gwinnett—Georgia; Greenwood—South Carolina; Swain—North Carolina.
57. A. FUMIPENNIS (Burmeister)—(12) Baker—Florida; Dooly, Gwinnett—Georgia; Wilkesboro—North Carolina.
58. A. SEDULA (Hagen)—(4) Greenwood—S. Carolina; Mecklenburg, McDowell—North Carolina.
59. A. TIBIALIS (Rambur)—(40) Baker, Liberty—Florida; Burke, Dooly, Floyd, Jefferson, Laurens—Georgia; Greenwood—South Carolina; Cherokee, Mecklenburg, Wayne, Wilkinson—North Carolina.
60. A. TRANSLATA (Hagen)—(10) Cherokee—North Carolina; Sevier—Tennessee.
61. A. VIOLACEA (Hagen)—(19) McDowell, Swain—North Carolina.
62. AMPHIAGRION SAUCIUM (Burmeister)—(1) Ashe—North Carolina.
63. CHROMAGRION CONDITUM (Hagen)—(2) Macon—North Carolina.
64. ISCHNURA POSITA (Hagen)—(12) Dooly—Georgia; Mecklenburg, McDowell, Swain, Wilkes, Wilkinson—North Carolina.
65. I. VERTICALIS (Say)—(7) Burke—Georgia; Macon, McDowell—North Carolina.
66. ANOMALAGRION HASTATUM (Say)—(5) Gwinnett——Georgia; Macon, McDowell, Wilkinson—North Carolina.
67. ENALLAGMA ASPERSUM (Hagen)—(2) Macon—North Carolina.
68. E. DAECKII (Calvert)—(9) Wilkinson—North Carolina.
69. E. DOUBLEDAYI Selys—(3) Dooly—Georgia; McDowell—North Carolina.
70. E. DURUM (Hagen)—(1) Baker—Florida.
71. E. HAGENI (Walsh)—(15) Macon, Wilkinson—North Carolina.
72. E. SIGNATUM (Hagen)—(2) Laurens—Georgia; McDowell—North Carolina.

Because of the great amount of territory covered and the comparatively short time devoted to collecting, the results of the trip are mainly of survey value. The collection is qualitative rather than quantitative. The ratio of the number of species taken to the number of specimens is large.

While the primary objective of the expedition was the securing of specimens as indicated, much valuable information regarding geographic distribution and habits of the insects under observation was amassed.

The region collected over seems to have three more or less distinct geographic areas based upon the distribution of the dragonfly fauna. These are: (1) North Florida and southern Georgia, (Alachua, Baker, Glynn, Liberty and Wayne Counties). Central Georgia and southern South Carolina, (Burke, Dooly, Greenwood, Gwinnett, Jefferson, Johnson, Laurens, Newberry, Spalding and Wilkinson Counties). (3) North Georgia, North Carolina, eastern Tennessee, (Ashe, Caldwell, Cherokee, Floyd, Macon, Mecklenburg, McDowell, Sevier, Swain, Wilkes Counties).

The fauna of the North Carolina area was markedly different in many respects from that of the two regions further south. Also within this area there seems to be a secondary one which could be included in a circle drawn around Floyd Co., Ga., Sevier Co., Tenn., and Cherokee, Macon, and Swain Counties, N. C.

Some interesting observations on the species collected may be noted. *Macromia georgina* and *M. taeniolata* were flying together at Dublin (Laurens Co.) Ga. At Everett City (Glynn Co.) Ga., we found *Coryphaeschna, Nasiaeschna* and *Epiaeschna* together, and in addition five species of *Libellula*. As the habitat here was a broad road-side drainage ditch, skirting a hammock, the prolific dragon-fly fauna was the more remarkable. Along the Saluda river below Ware Shoals (Greenwood Co.) S. C. both North American species of *Pantala* were found.

The specimen of *Somatochlora elongata*, a typically northern species, was collected at Highlands (Macon Co.), N. C., at an

altitude of 4300 ft. Its presence here was probably due to the elevation effect on temperature.

The capture of two specimens of *Dromogomphus armatus* came as a surprise, as little has been heard from this species since it was described by Selys in 1854.

The Gomphines of the North Carolina secondary area are of peculiar interest, several of them being undescribed species in all probability.

As mentioned before the collection is essentially fluviatile. Consequently the best represented of the genera is the genus *Argia*. There were 149 specimens (roughly 30% of the collection) and all of the eastern North American species (8) taken in this group. Contrariwise the genera *Enallagma* and *Ischnura* suffered from confining our attention to rivers.

Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

•Papers containing new forms or names have an • preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☛*Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

GENERAL.—Cockerell, T. D. A.—[Review of Howard's History of Applied Entomology]. [68] 73: 186-188. **Emerton, J. H.**—Obituary. By N. Banks. [4] 63: 23-24. **Hartzell, F. Z.**—Ecotopographic maps: their use in entomology and notes on making. [12] 24: 151-157, ill. **Hayward, K. J.**—Some further notes on insect migration in Argentina. [9] 64: 40-41. **Hoffman, A.**—Entomologen-Adressbuch. Annuaire des entomologistes Entomologist's directory. Auf. III. Wien 1930, 357 pp. **Omer-Cooper, J.**—Species-pairs

among insects. [31] 127: 237. **Osborn, H.**—Bibliography of Ohio zoology. [Ohio Biol. Surv., Bull.] 23: 353-410. **Zwölfer, W.**—Zur theorie der insektenepidemien. [97] 50: 724-759.

ANATOMY, PHYSIOLOGY, ETC.—Bonnet, P.—La mue, l'autotomie et la régénération chez les Araignées, avec une étude des Dolomèdes d'Europe. [Bull. Soc. Hist. Nat., Toulouse] 59: 237-700, ill. **Clark, L. B.**—Some factors involved in the reaction of insects to changes in luminous intensity. [Jour. Exp. Zool.] 58: 31-42, ill. **de Boissezon, P.**—Contribution a l'étude de la biologie et de l'histophysiologie de Culex pipiens. [Arch. Zool. Exp. et Gen., Paris] 70: 281-431, ill. **Gorter, F. J.**—Köcherbauversuche an trichopterenlarven. [46] 20: 443-532. **Mukerji, D.**—On the respiratory system of the Cybister larva. [Arch. Zool. Exp. et Gen., Paris] 70: 433-467, ill. **Nowikoff, M.**—Untersuchungen über die komplexaugen von lepidopteren nebst einigen bemerkungen über die rhabdome der Arthropoden im allgemeinen. [94] 138: 1-67, ill. **Prell, H.**—Anopheles und die Malaria. [Flugs. Deut. Ges. angew. Ent.] 9: 61 pp., ill. **Valentine, J. M.**—The olfactory sense of the adult meal worm beetle Tenebrio molitor. [Jour. Exp. Zool.] 58: 165-228, ill. **Zernoff, V.**—L'immunité et les anticorps non spécifiques chez les insectes (Chenilles de Galleria mellionella). [77] 96: 151-153.

ARACHNIDA AND MYRIOPODA.—*Bryant, E. B.—A revision of the American species of the genus Ozyptila. [5] 37: 375-391, ill. ***Mello-Leitão.**—Aphantochilidas e Thomisidas do Brasil. [Arch. Mus. Nac., Rio de Janeiro] 31: 9-13.

THE SMALLER ORDERS OF INSECTS.—Brues, C. T.—Jewelled caddis-worm cases. [5] 37: 392-394. ***Longinos Navás, R. P.**—Insectos de la Argentina. [Rev. Soc. Ent. Argentina] 3: 125-132, ill. ***Moulton & Steinweden.**—A new Taeniothrips on gladiolus. [4] 63: 20-21, ill.

ORTHOPTERA.—Rosas Costa, J. A.—Notas sobre tres ortopteros anomalos. [Rev. Soc. Ent. Argentina] 3: 67-70, ill.

HEMIPTERA.—Baker, A. D.—A study of the male genitalia of Canadian species of Pentatomidae. [Canadian Jour. Res.] 4: 148-179, ill., cont. ***deLong, D. M.**—A revision of the American species of Empoasca known to occur north of Mexico. [U. S. Dept. Agric.] Tech. Bull. 231: 60 pp., ill. **Ekblom, T.**—Morphological and biological studies of the Swedish families of Hemiptera-Heteroptera. [Zool.

Bidr. Upsal.] 12: 113-150, ill. ***Hungerford, H. B.**—A new Velia from Trinidad (Veliidae). [75] 7: 172-175, ill. ***Melin, D.**—Hemiptera from South and Central America. [Zool. Bidr. Upsal.] 12: 151-198, ill. ***Metcalf & Bruner.**—Cuban Fulgorina. The families Tropiduchidae and Acanaloniidae. [5] 37: 395-424, ill. **Zweigelt, F.**—Blattlausgallen. Histogenetische und biologische studien an Tetraneura-und Schizoneuragallen. [Monograph. angew. Ent.] 11: 684 pp., ill.

LEPIDOPTERA.—Bourquin, F.—Algunas observaciones sobre Castniidae. [Rev. Soc. Ent. Argentina] 3: 173-174, ill. (S). ***Breyer, A.**—Lepidopteros nuevos para la Rep. Argentina. Lepidopteros de Yacanto especies nuevas, raras y comunes. (S). [Rev. Soc. Ent. Argentina] 3: 151-152, ill; 169-172, ill. ***Brown, F. M.**—A revision of the genus Aphrissa. (S). [40] 454: 14 pp., ill. **Cook, W. C.**—An ecologically annotated list of the Phalaenidae of Montana. [4] 63: 1-9, cont. ***Draudt, M.**—Neue Amatiden des amerikanischen faunengebietes. [17] 48: 33-36, cont. (S). ***Jorgensen, P.**—Las especies de Castniidae de la Argentina y Paraguay. [Rev. Soc. Ent. Argentina] 3: 175-180, ill. ***Köhler, P.**—Un nuevo Saturnido argentino, Mesoleuca bruchi sp. n. [Rev. Soc. Ent. Argentina] 3: 149-150, ill. **Köhler, P.**—Los Dioptidae argentinos. Notas biologicas acerca de Ctenucha vittigera lativitta. [Rev. Soc. Ent. Argentina] 3: 153-162, ill; 167-168, ill. **Martin & Ingham.**—An annotated list of the diurnal lepidoptera of Huntington Lake Region, Fresno County, California. [38] 29: 115-134, ill. **Nosswitz, F.**—Nota sobre Epistor lugubris. Un Morpho ginandromorfo. [Rev. Soc. Ent. Argentina] 3: 163; 165-166, ill. ***Riley, N. D.**—A new Ithomiine. [9] 64: 35 (S). **Schwanwitsch, B. N.**—Studies upon the wing-pattern of Prepona and Agrias two genera of South-American nymphalid butterflies. [Acta Zool., Stockholm] 11: 289-424, ill.

DIPTERA.—*Bequaert, J.—The genus Lasia (Cyrtidae) in North America, with descriptions of two new species. [40] 455: 11 pp., ill. **Bequaert, J.**—Notes on Hippoboscidae. 2. The sub-family Hippoboscinae. [5] 37: 303-326. **Curran, C. H.**—First supplement to the "Diptera of Porto Rico and the Virgin Islands." [40] 456: 23 pp., ill. **Dunn, L. H.**—Rearing the larvae of Dermatobia hominis in man. [5] 37: 327-342, ill. ***Gemignani, E. V.**—Las especies argentinas del genero Mallophora y descripción de cuatro nuevas especies. [Rev. Soc. Ent. Argentina] 3: 133-144. **Hegh, E.**—Les Tsé-Tsés. Tome I. Bruxelles 1929, 742 pp., ill. ***Lindner, E.**—Die ausbeute der deutschen Chaco-Expedition 1925-26. Rhopalomeridae und Ortalididae. (S). [56] 9: 282-284. ***Malloch, J. R.**—Exotic Muscaridae. [75]

7: 185-200. **Shannon, R. C.**—The environment and behavior of some Brazilian mosquitoes. [10] 33: 1-27.

COLEOPTERA.—*Borchmann, F.—Alleculidae y Meloidae. (S). [Rev. Soc. Ent. Argentina] 3: 85-100, ill. **Brown, W. J.**—Revision of the North American Aegialiinae. [4] 63: 9-19, ill., cont. ***Bruch, C.**—Histéridos huéspedes de Pheidole. Coleópteros nuevos y poco conocidos. (S). [Rev. Soc. Ent. Argentina] 3: 1-12, ill., 31-42, ill. ***Chapin, E. A.**—A new Serica from New Jersey. [95] 44: 5-6. ***de Carlo, J. A.**—Familia Belostomidae. Géneros y especies para la Argentina. [Rev. Soc. Ent. Argentina] 3: 101-124, ill. ***Ogloblin, A. A.**—Notes on Bethylidae with the description of two new species from Missiones. [Rev. Soc. Ent., Argentina] 3: 15-27, ill. Beitrag zur kenntnis der neotropischen Halticinen I. [Rev. Soc. Ent. Argentina] 3: 47-53, ill. ***Pic, M.**—Deux nouveaux Hétéromeres de la République Argentine. Nouveaux Coléoptéres de diverses familles. (Coléoptêres nouveaux de la République Argentine. [Rev. Soc. Ent. Argentina] 3: 29-30, 43-46, 55-56. ***Pic, M.**—Nouveautés diverses. (S). [Mel. Ex. Ent.] Fasc. 55-56: 36 pp., 36 pp. ***Théry, A.**—Observations sur quelques Buprestidae du genre Halecia. (S). [33] 70: 289-304. ***Tillyard, R. J.**—Kansas permian insects, part 13. The new order Protelytroptera, with a discussion of its relationships. [16] 21: 232-266, ill. **Tremoleras, J.**—La fecha de publicación de los Carabidos descriptos por Brullé en el "Voyage" de D'Orbugny. [Rev. Soc. Ent. Argentina] 3: 147-148. **Ware, R. E.**—Some notes on collecting Cerambycidae. [Proc. Iowa Ac. Aci.] 36: 367-369. **Zotta, A.**—Un ejemplar topotipo de la especie argentina del genero Camptodontus. [Rev. Soc. Ent. Argentina] 3: 145-146.

HYMENOPTERA.—Bruch, C.—Notas preliminares acerca de Labauchena daguerrei. [Rev. Soc. Ent. Argentina] 3: 73-80, ill. (S). ***Carpenter, F. M.**—The lower permian insects of Kansas, Part 3. The protohymenoptera. [5] 37: 343-374, ill. ***Cockerell, T. D. A.**—Some notes on bees of the genus Andrena. [4] 63: 22-23. ***Dettmer, H.**—Beschreibung von fünf neuen Cynipidenarten, worunter eine neue gattung. (S). [Brotéria] 26: 54-68, ill. **Dozier, H. L.**—A new scelionid egg parasite of the black widow spider. [10] 33: 27-28. **Haupt, H.**—Die einordnung der mir bekannten Psammocharidae mit 2 cubitalzellen in mein system. [Mitt. Zool. Mus., Berlin] 16: 673-797, ill. ***Santschi, F.**—Un nouveau genre de fourmi parasite sans ouvrières de l'Argentine. [Rev. Soc. Ent. Argentina] 3: 81-82, ill. **Vandel, A.**—Étude d'un gynandromorphe (dinergatandromorphe) de Pheidole pallidula (Formicidés). [78] 65: 114-129, ill.

DEMONS OF THE DUST. By WILLIAM MORTON WHEELER Professor of Entomology in Harvard University. A study in Insect Behavior. W. W. Norton & Company, Inc., Publishers. New York, 1930. Pp. xi, 378, frontispiece and 47 illustrations. $5.00.—"The 'demons' of this volume are the inhabitants of extreme desertic environments, sand and dust, It is scarcely necessary to state that the word 'demon' is here used metaphorically and in the modern sense of 'a malevolent being.' The term has suffered many changes of meaning. To Homer and Hesiod it meant a benevolent supernatural being, or god, and when Socrates spoke of his *daimon* he obviously meant a benevolent spirit like the guardian angel of the devout Catholic. . . . This volume deals mainly with two unrelated groups of insect demons which have acquired a very similar type of behavior as the result of living in dry dust or sand, which as Buxton (1923) says 'is in many ways the most hostile of all environments,' for as he remarks later in his fine treatise [Animal Life in Deserts] 'sand probably presents more difficulties to the flora and fauna which attempt to colonize it than does any other type of desert' . . . And more intimate acquaintance with the organisms most exquisitely adapted to live under such difficult conditions is sure to arouse a peculiar feeling of the sinister, malignant, weird or supernatural, or what Goethe called the 'demoniac.' These terms are all fine examples of the besetting sin of verbalism, of the tacit assumption that there must be an actual objective existent corresponding to a mental process or state because we can coin a name for it. If this be borne in mind, there is no reason why we may not designate as demons animal organisms that exhibit disconcerting or even monstrous forms and behavior as a result of their structural and functional adaptation to extreme environmental conditions." (Pp. 40, 41.)

After a chapter devoted to the eighteenth century naturalists, Pluche, Réaumur, Bonnet, Roesel, Queen Ulrica Louisa of Sweden and Degeer, to whom the foundations of our knowledge of these demons is due, and another on the fauna of the sands in general, the third chapter (62 pages) is a summary of post-eighteenth century observations on the Ant-lions, their taxonomy, larval structure and behavior. The fourth to eighth chapters present similar accounts of those curious Diptera, of the family Rhagionidae, or Leptidae, to whose larvae Réaumur applied the name of worm-lions in 1753. They are treated as of five specific groups: Mediterranean, *Vermileo vermileo* Linnaeus; Sierra, *V. comstocki* Wheeler and *V. opaqus* Coquillett; the genus *Lampromyia*, of Africa, Spain and the Canary Islands; the little known *Vermitigris fairchildi* Wheeler, of Sumatra and perhaps Borneo; and two almost equally little known

species from Cuba, Jamaica and Guerrero, Mexico. To knowledge of all of these worm-lions, Prof. Wheeler adds much from his own investigations in field and laboratory.

"It would be easy to make a long list of the detailed resemblances between the ant-lion and worm-lion, including the various taxes and sensory reactions of the larva, its normally biennial life-span, the excavation of the pitfall; lying in wait, the poisoning, burial and extraintestinal digestion of the prey, the occlusion of the posterior end of the stomach, death-feigning, the ability to remain for long months in asitotic stupor, pupation in the sand, the wriggling of the pupa up to the surface to permit eclosion of the imago, etc. On the other hand certain striking differences are to be noticed between the two insects." (P. 280.)

All these resemblances and differences are discussed in appropriate places throughout the text, with true Wheelerian breadth of view and humor, nor is a new term lacking to designate these demons and many others "which ambush instead of actively seeking their prey. . . . I shall . . . call them *lochetic* (from *lochetikos*, lying in wait, entrapping). In this category we may even include such insectivorous plants as the sundews (Drosera), pitcher-plants (Sarracenia, Nepenthes) and the Venus' fly-trap (Dionaea). Among animals we have an extraordinary diversity of forms, ranging from the sea-anemones, Hydroids, corals, tube-dwelling Annelids, Crinoids and Polyzoa to many reptiles, such as the Anniella described on p. 70 and at least one group of mammals, the cats" (p. 284). Many of these *lochetes* are considered and the reviewer, unable to conceal his own peculiar behavior pattern, hastens to add the unmentioned Odonate larvae to the list. "The ambushing or lochetic, animals are also important as excellent examples of convergent evolution, a principle which, to my knowledge, has not been treated monographically since the publication of Willey's work in 1911" (p. 295).

In connection with the worm-lions the question is again raised as to "the relative value to be attached to larval and imaginal characters in the classification of insects" (p. 193). It is not directly answered, but the last complete sentence on page 190 seems to indicate Prof. Wheeler's belief that the imaginal characters are to be assigned greater weight.

Two appendices give translations of Degeer's (1752) and Réaumur's (1753) original memoirs on the worm-lion and its fly. There is the ever praiseworthy bibliography (pp. 337-362) and finally the index. Although heavier than is comfortable for the hand, the book is attractively made and printed in good legible type. P. P. CALVERT.